SEQUENCE LISTING

<110> Imamura, Toru
Asada, Masahiro
Oka, Syuichi
Suzuki, Masashi
Yoneda, Atsuko
Ota, Keiko
Oda, Yuko
Miyakawa, Kazuko
Orikasa, Noriko
Asada, Chie
Kojima, Tetsuhito

<120> HEPARIN-BINDING PROTEINS MODIFIED WITH SUGAR CHAINS, METHOD OF PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

<130> 382.1019

<140> 09/121,017
<141> 1998-07-22

<150> 307721/1997
<151> 1997-11-10

<160> 31

<170> PatentIn Ver. 2.0

<210> 1

<211> 221

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of human rydocan and a part of human fibroblast growth factor 1

<400> 1

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly
1 5 10 15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu
20 25 30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val
35 40 45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly
50 55 60

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His
65 70 75 80

Pro Leu Val Pro Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr
85 90 95

Start of human fibroblast growth factor 1

Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val
100 105 110

Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser
115 120 125

Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln
130 135 140

Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro
145 150 155 160

Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn
165 170 175

Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu
180 185 190

Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln
195 200 205

Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
210 215 220

<210> 2

<211> 663

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human rydocan and a part of human fibroblast

growth factor 1

<220>

<221> CDS

<222> (1)..(663)

<400> 2

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atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga   48
Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly
  1               5                  10                  15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc   96
Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu
             20                  25                  30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta   144
Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val
         35                  40                  45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga   192
Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly
     50                  55                  60

gat ctg gat gac ttg gaa gac tcc atg atc ggc cct gaa gtt gtc cat   240
Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His
 65                  70                  75                  80

ccc ttg gtg cct cta gat gct aat tac aag aag ccc aaa ctc ctc tac   288
Pro Leu Val Pro Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr
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85 90 95

tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc aca gtg 336
Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val
100 105 110

gat ggg aca agg gac agg agc gac cag cac att cag ctg cag ctc agt 384
Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser
115 120 125

gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act ggc cag 432
Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln
130 135 140

tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag aca cca 480
Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro
145 150 155 160

aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat tac aac 528
Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn
165 170 175

acc tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt ggc ctc 576
Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu
180 185 190

aag aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat ggc cag 624
Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln
195 200 205

aaa gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat 663

Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
210 215 220

<210> 3

<211> 175

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of mouse fibroblast growth factor 6 and a part of human fibroblast growth factor 1

<400> 3

Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
1 5 10 15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
20 25 30

Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu.
35 40 45

Start of human fibroblast growth factor 1.

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly
50 55 60

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln
65 70 75 80

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr
85 90 95

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln
100 105 110

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His
115 120 125

Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val
130 135 140

end of human fibroblast growth factor 1

Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr
145 150 155 160

Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
165 170 175

<210> 4
<211> 525
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: fusion of sequence for a part of mouse fibroblast growth factor 6 and a part of human fibroblast growth factor 1

<220>
<221> CDS
<222> (1)..(525)

<400> 4

atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
1 5 10 15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96
Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
20 25 30

cgc gcc aac ggc acg cta ctg gac gct aat tac aag aag ccc aaa ctc 144
Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu
35 40 45

ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc 192
Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly
50 55 60

aca gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag 240
Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln
65 70 75 80

ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act 288
Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr
85 90 95

ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag 336
Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln
100 105 110

```
aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat   384
Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His
        115                 120                 125

tac aac acc tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt   432
Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val
    130                 135                 140

ggc ctc aag aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat   480
Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr
145                 150                 155                 160

ggc cag aaa gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat       525
Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
                165                 170                 175
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<210> 5

<211> 181

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of mouse fibroblast growth factor 6, a part of human fibroblast growth factor 1 and an artificial sequence

<400> 5

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Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
```

1 5 10 15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala

20 25 30

Arg Ala Gln Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu

35 40 45

start of human fibroblast growth factor 1

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly

50 55 60

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln

65 70 75 80

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr

85 90 95

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln

100 105 110

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Ala Ala

115 120 125

inserted confirmed sequence

Thr Pro Ala Pro Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala

130 135 140

Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg

145 150 155 160

Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu

165 170 175

Pro Val Ser Ser Asp
180

<210> 6
<211> 543
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: fusion of
sequence for a part of mouse fibroblast growth factor 6,
a part of human fibroblast growth factor 1 and an artificial
sequence

<220>
<221> CDS
<222> (1)..(543)

<400> 6
atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
1 5 10 15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96
Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
20 25 30

cgc gcc caa ggc acg cta ctg gac gct aat tac aag aag ccc aaa ctc 144

```
Arg Ala Gln Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu
         35                  40                  45

ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc   192
Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly
     50                  55                  60

aca gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag   240
Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln
 65                  70                  75                  80

ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act   288
Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr
                 85                  90                  95

ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag   336
Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln
            100                 105                 110

aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag gct gct   384
Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Ala Ala
        115                 120                 125

act cca gct cca aac cat tac aac acc tat ata tcc aag aag cat gca   432
Thr Pro Ala Pro Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala
    130                 135                 140

gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc tgc aaa cgc   480
Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg
145                 150                 155                 160
```

ggt cct cgg act cac tat ggc cag aaa gca atc ttg ttt ctc ccc ctg 528
Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu
165 170 175

cca gtc tct tct gat 543
Pro Val Ser Ser Asp
180

<210> 7
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer for PCR

<400> 7
ttgtcgaccc accatggccc ccgcccgtct 30

<210> 8
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:primer for PCR

<400> 8

ttgatatcta gaggcaccaa gggatg 26

<210> 9

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 9

gcgtcgacag cgctaattac aagaagccca aactc 35

<210> 10

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 10

ccgaattcga attctttaat cagaagagac tgg 33

<210> 11

<211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 11

gcgtcgaccc accatgtccc ggggagcagg acgtgttcag ggcacgctgc aggctctcgt 60

cttc 64

<210> 12

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 12

gcgatatcca gtagcgtgcc gttggcgcg 29

<210> 13

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 13

gcgtcgaccc accatgtc 18

<210> 14

<211> 29

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 14

gcgatatcca gtagcgtgcc ttgggcgcg 29

<210> 15

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 15

gctggaggag gctgctactc cagctccaaa ccattaca 38

<210> 16

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 16

gccgctctag aactagtgga t 21

<210> 17

<211> 200

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of human ryudocan and a part of human fibroblast growth factor 1

<400> 17

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly
1 5 10 15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu
20 25 30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val
35 40 45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly
50 55 60

Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly
65 70 75 80

start of FGF1

His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp
85 90 95

Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly
100 105 110

Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp
115 120 125

Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu
130 135 140

Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys
145 150 155 160

Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser
165 170 175

Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe
180 185 190

Leu Pro Leu Pro Val Ser Ser Asp
195 200

<210> 18

<211> 600

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human fibroblast

growth factor 1

<220>

<221> CDS

<222> (1)..(600)

<400> 18

atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga 48

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1 5 10 15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20 25 30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta 144

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35 40 45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga 192

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50 55 60

```
gat gct aat tac aag aag ccc aaa ctc ctc tac tgt agc aac ggg ggc   240
Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly
 65                  70                  75                  80

cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat ggg aca agg gac   288
His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp
                 85                  90                  95

agg agc gac cag cac att cag ctg cag ctc agt gcg gaa agc gtg ggg   336
Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly
            100                 105                 110

gag gtg tat ata aag agt acc gag act ggc cag tac ttg gcc atg gac   384
Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp
        115                 120                 125

acc gac ggg ctt tta tac ggc tca cag aca cca aat gag gaa tgt ttg   432
Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu
    130                 135                 140

ttc ctg gaa agg ctg gag gag aac cat tac aac acc tat ata tcc aag   480
Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys
145                 150                 155                 160

aag cat gca gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc   528
Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser
                165                 170                 175

tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa gca atc ttg ttt   576
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Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe
180 185 190

ctc ccc ctg cca gtc tct tct gat 600
Leu Pro Leu Pro Val Ser Ser Asp
195 200

<210> 19
<211> 200
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: fusion of sequence for a part of human ryudocan mutant and a part of human fibroblast growth factor 1

<400> 19
Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly
1 5 10 15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu
20 25 30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Ser Asp Asp Glu Asp Val
35 40 45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly
50 55 60

Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly
65 70 75 80

His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp
85 90 95

Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly
100 105 110

Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp
115 120 125

Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu
130 135 140

Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys
145 150 155 160

Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser
165 170 175

Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe
180 185 190

Leu Pro Leu Pro Val Ser Ser Asp
195 200

<210> 20

<211> 600

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of human ryudocan mutant and a part of human fibroblast growth factor 1

<220>

<221> CDS

<222> (1)..(600)

<400> 20

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atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga   48
Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly
  1               5                  10                  15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc   96
Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu
             20                  25                  30

cta gaa ggc cga tac ttc tcc gga gcc cta tca gac gat gag gat gta   144
Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Ser Asp Asp Glu Asp Val
         35                  40                  45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga   192
Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly
     50                  55                  60

gat gct aat tac aag aag ccc aaa ctc ctc tac tgt agc aac ggg ggc   240
Asp Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly
```

65 70 75 80

cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat ggg aca agg gac 288
His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg Asp
85 90 95

agg agc gac cag cac att cag ctg cag ctc agt gcg gaa agc gtg ggg 336
Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val Gly
100 105 110

gag gtg tat ata aag agt acc gag act ggc cag tac ttg gcc atg gac 384
Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp
115 120 125

acc gac ggg ctt tta tac ggc tca cag aca cca aat gag gaa tgt ttg 432
Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu
130 135 140

ttc ctg gaa agg ctg gag gag aac cat tac aac acc tat ata tcc aag 480
Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys
145 150 155 160

aag cat gca gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc 528
Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser
165 170 175

tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa gca atc ttg ttt 576
Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe
180 185 190

ctc ccc ctg cca gtc tct tct gat 600

Leu Pro Leu Pro Val Ser Ser Asp

195 200

<210> 21

<211> 254

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of human ryudocan and a part of human fibroblast growth factor 1

<400> 21

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1 5 10 15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20 25 30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35 40 45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50 55 60

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His

65 70 75 80

Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly
85 90 95

Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile
100 105 110

Pro Lys Arg Ile Ser Pro Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu
115 120 125

start of FGF1

Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr
130 135 140

Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu
145 150 155 160

Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly
165 170 175

Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr
180 185 190

Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr
195 200 205

Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly
210 215 220

Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly
225 230 235 240

Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
245 250

<210> 22

<211> 762

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of human ryudocan and a part of human fibroblast growth factor 1

<220>

<221> CDS

<222> (1)..(762)

<400> 22

atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga 48
Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly
1 5 10 15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96
Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu
20 25 30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta 144
Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

```
         35                  40                  45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga   192
Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly
     50                  55                  60

gat ctg gat gac ttg gaa gac tcc atg atc ggc cct gaa gtt gtc cat   240
Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His
 65                  70                  75                  80

ccc ttg gtg cct cta gat aac cat atc cct gag agg gca ggg tct ggg   288
Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly
                 85                  90                  95

agc caa gtc ccc acc gaa ccc aag aaa cta gag gag aat gag gtt atc   336
Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile
            100                 105                 110

ccc aag aga atc tca ccc gtt gct aat tac aag aag ccc aaa ctc ctc   384
Pro Lys Arg Ile Ser Pro Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu
        115                 120                 125

tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc aca   432
Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr
    130                 135                 140

gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag ctc   480
Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu
145                 150                 155                 160
```

agt gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act ggc 528
Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly
165 170 175

cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag aca 576
Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr
180 185 190

cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat tac 624
Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr
195 200 205

aac acc tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt ggc 672
Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly
210 215 220

ctc aag aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat ggc 720
Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly
225 230 235 240

cag aaa gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat 762
Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
245 250

<210> 23
<211> 281
<212> PRT
<213> Artificial Sequence

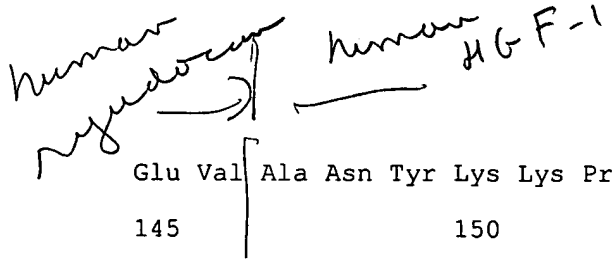
<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human fibroblast

growth factor 1

<400> 23

```
Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly
 1               5                  10                  15

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu
            20                  25                  30

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val
        35                  40                  45

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly
    50                  55                  60

Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His
65                  70                  75                  80

Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly
                85                  90                  95

Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile
            100                 105                 110

Pro Lys Arg Ile Ser Pro Val Glu Glu Ser Glu Asp Val Ser Asn Lys
        115                 120                 125

Val Ser Met Ser Ser Thr Val Gln Gly Ser Asn Ile Phe Glu Arg Thr
    130                 135                 140
```



Glu Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly
145 150 155 160

Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg
165 170 175

Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val
180 185 190

Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met
195 200 205

Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys
210 215 220

Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser
225 230 235 240

Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly
245 250 255

Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu
260 265 270

Phe Leu Pro Leu Pro Val Ser Ser Asp
275 280

<210> 24

<211> 843

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of

sequence for a part of human ryudocan and a part of human fibroblast

growth factor 1

<220>

<221> CDS

<222> (1)..(843)

<400> 24

atg gcc ccc gcc cgt ctg ttc gcg ctg ctg ctg ttc ttc gta ggc gga 48

Met Ala Pro Ala Arg Leu Phe Ala Leu Leu Leu Phe Phe Val Gly Gly

1 5 10 15

gtc gcc gag tcg atc cga gag act gag gtc atc gac ccc cag gac ctc 96

Val Ala Glu Ser Ile Arg Glu Thr Glu Val Ile Asp Pro Gln Asp Leu

20 25 30

cta gaa ggc cga tac ttc tcc gga gcc cta cca gac gat gag gat gta 144

Leu Glu Gly Arg Tyr Phe Ser Gly Ala Leu Pro Asp Asp Glu Asp Val

35 40 45

gtg ggg ccc ggg cag gaa tct gat gac ttt gag ctg tct ggc tct gga 192

Val Gly Pro Gly Gln Glu Ser Asp Asp Phe Glu Leu Ser Gly Ser Gly

50 55 60

```
gat ctg gat gac ttg gaa gac tcc atg atc ggc cct gaa gtt gtc cat   240
Asp Leu Asp Asp Leu Glu Asp Ser Met Ile Gly Pro Glu Val Val His
 65                  70                  75                  80

ccc ttg gtg cct cta gat aac cat atc cct gag agg gca ggg tct ggg   288
Pro Leu Val Pro Leu Asp Asn His Ile Pro Glu Arg Ala Gly Ser Gly
                 85                  90                  95

agc caa gtc ccc acc gaa ccc aag aaa cta gag gag aat gag gtt atc   336
Ser Gln Val Pro Thr Glu Pro Lys Lys Leu Glu Glu Asn Glu Val Ile
            100                 105                 110

ccc aag aga atc tca ccc gtt gaa gag agt gag gat gtg tcc aac aag   384
Pro Lys Arg Ile Ser Pro Val Glu Glu Ser Glu Asp Val Ser Asn Lys
        115                 120                 125

gtg tca atg tcc agc act gtg cag ggc agc aac atc ttt gag aga acg   432
Val Ser Met Ser Ser Thr Val Gln Gly Ser Asn Ile Phe Glu Arg Thr
    130                 135                 140

gag gtc gct aat tac aag aag ccc aaa ctc ctc tac tgt agc aac ggg   480
Glu Val Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys Ser Asn Gly
145                 150                 155                 160

ggc cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat ggg aca agg   528
Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp Gly Thr Arg
                165                 170                 175

gac agg agc gac cag cac att cag ctg cag ctc agt gcg gaa agc gtg   576
Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala Glu Ser Val
            180                 185                 190
```

ggg gag gtg tat ata aag agt acc gag act ggc cag tac ttg gcc atg 624
Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr Leu Ala Met
195 200 205

gac acc gac ggg ctt tta tac ggc tca cag aca cca aat gag gaa tgt 672
Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn Glu Glu Cys
210 215 220

ttg ttc ctg gaa agg ctg gag gag aac cat tac aac acc tat ata tcc 720
Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr Tyr Ile Ser
225 230 235 240

aag aag cat gca gag aag aat tgg ttt gtt ggc ctc aag aag aat ggg 768
Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly
245 250 255

agc tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa gca atc ttg 816
Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu
260 265 270

ttt ctc ccc ctg cca gtc tct tct gat 843
Phe Leu Pro Leu Pro Val Ser Ser Asp
275 280

<210> 25
<211> 172
<212> PRT
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of sequence for a part of mouse fibroblast growth factor 6 and a part of human fibroblast growth factor 1

<400> 25

```
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
 1               5                  10                  15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
            20                  25                  30

Arg Ala Asn Gly Ser Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys
        35                  40                  45

Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp
    50                  55                  60

Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala
65                  70                  75                  80

Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr
                85                  90                  95

Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn
            100                 105                 110

Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr
        115                 120                 125
```

Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys
130 135 140

Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys
145 150 155 160

Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
165 170

<210> 26
<211> 516
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: fusion of
sequence for a part of mouse fibroblast growth factor 6 and
a part of human fibroblast growth factor 1

<220>
<221> CDS
<222> (1)..(516)

<400> 26
atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
1 5 10 15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96

```
Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
             20                  25                  30

cgc gcc aac ggc tcg gct aat tac aag aag ccc aaa ctc ctc tac tgt   144
Arg Ala Asn Gly Ser Ala Asn Tyr Lys Lys Pro Lys Leu Leu Tyr Cys
         35                  40                  45

agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc aca gtg gat   192
Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly Thr Val Asp
     50                  55                  60

ggg aca agg gac agg agc gac cag cac att cag ctg cag ctc agt gcg   240
Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln Leu Ser Ala
 65                  70                  75                  80

gaa agc gtg ggg gag gtg tat ata aag agt acc gag act ggc cag tac   288
Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr Gly Gln Tyr
                 85                  90                  95

ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag aca cca aat   336
Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln Thr Pro Asn
            100                 105                 110

gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac cat tac aac acc   384
Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn His Tyr Asn Thr
        115                 120                 125

tat ata tcc aag aag cat gca gag aag aat tgg ttt gtt ggc ctc aag   432
Tyr Ile Ser Lys Lys His Ala Glu Lys Asn Trp Phe Val Gly Leu Lys
    130                 135                 140
```

aag aat ggg agc tgc aaa cgc ggt cct cgg act cac tat ggc cag aaa 480
Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg Thr His Tyr Gly Gln Lys
145 150 155 160

gca atc ttg ttt ctc ccc ctg cca gtc tct tct gat 516
Ala Ile Leu Phe Leu Pro Leu Pro Val Ser Ser Asp
165 170

<210> 27
<211> 210
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: fusion of
sequence for a part of mouse fibroblast growth factor 6 and
a part of human fibroblast growth 1

<400> 27
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
1 5 10 15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
20 25 30

Arg Ala Asn Gly Thr Leu Leu Asp Ser Arg Gly Trp Gly Thr Leu Leu
35 40 45

Ser Arg Ser Arg Ala Gly Leu Ala Gly Glu Ile Ser Gly Val Asn Trp

human FGF-1

```
     50                  55                  60
Glu Ser Gly Tyr Leu Val Gly Ile Lys Arg Gln Ala Asn Tyr Lys Lys
 65                  70                  75                  80

Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu
                85                  90                  95

Pro Asp Gly Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile
            100                 105                 110

Gln Leu Gln Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser
        115                 120                 125

Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr
    130                 135                 140

Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu
145                 150                 155                 160

Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn
                165                 170                 175

Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg
            180                 185                 190

Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser
        195                 200                 205

Ser Asp
    210
```

<210> 28

<211> 630

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of
sequence for a part of mouse fibroblast growth factor 6 and
a part of human fibroblast growth 1

<220>

<221> CDS

<222> (1)..(630)

<400> 28

```
atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc   48
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
  1               5                  10                  15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc   96
Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
             20                  25                  30

cgc gcc aac ggc acg cta ctg gac tcc aga ggc tgg ggc acc ctc ttg   144
Arg Ala Asn Gly Thr Leu Leu Asp Ser Arg Gly Trp Gly Thr Leu Leu
         35                  40                  45

tcc agg tct cga gct ggg cta gct gga gag att tcg ggt gtg aat tgg   192
```

Ser Arg Ser Arg Ala Gly Leu Ala Gly Glu Ile Ser Gly Val Asn Trp
50 55 60

gaa agc ggc tat ttg gtg ggc att aag cga cag gct aat tac aag aag 240
Glu Ser Gly Tyr Leu Val Gly Ile Lys Arg Gln Ala Asn Tyr Lys Lys
65 70 75 80

ccc aaa ctc ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt 288
Pro Lys Leu Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu
85 90 95

ccg gat ggc aca gtg gat ggg aca agg gac agg agc gac cag cac att 336
Pro Asp Gly Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile
100 105 110

cag ctg cag ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt 384
Gln Leu Gln Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser
115 120 125

acc gag act ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac 432
Thr Glu Thr Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr
130 135 140

ggc tca cag aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag 480
Gly Ser Gln Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu
145 150 155 160

gag aac cat tac aac acc tat ata tcc aag aag cat gca gag aag aat 528
Glu Asn His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu Lys Asn
165 170 175

tgg ttt gtt ggc ctc aag aag aat ggg agc tgc aaa cgc ggt cct cgg 576
Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly Pro Arg
180 185 190

act cac tat ggc cag aaa gca atc ttg ttt ctc ccc ctg cca gtc tct 624
Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro Val Ser
195 200 205

tct gat 630
Ser Asp
210

<210> 29
<211> 180
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: fusion of sequence for a part of mouse fibroblast growth factor 6, a part of human fibroblast growth factor 1 and an artificial sequence

<400> 29
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
1 5 10 15

Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
20 25 30

human FGF-1

```
Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu
        35                  40                  45

Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly
    50                  55                  60

Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln
65                  70                  75                  80

Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr
                85                  90                  95

Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln
            100                 105                 110

Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn Ala
        115                 120                 125

Thr Pro Ala Pro His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu
    130                 135                 140

Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly
145                 150                 155                 160

Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro
                165                 170                 175

Val Ser Ser Asp
            180
```

<210> 30

<211> 540

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: fusion of
sequence for a part of mouse fibroblast growth factor 6,
a part of human fibroblast growth factor 1 and an artificial
sequence

<220>

<221> CDS

<222> (1)..(540)

<400> 30

atg tcc cgg gga gca gga cgt gtt cag ggc acg ctg cag gct ctc gtc 48
Met Ser Arg Gly Ala Gly Arg Val Gln Gly Thr Leu Gln Ala Leu Val
1 5 10 15

ttc tta ggc gtc cta gtg ggc atg gtg gtg ccc tca cct gcc ggc gcc 96
Phe Leu Gly Val Leu Val Gly Met Val Val Pro Ser Pro Ala Gly Ala
20 25 30

cgc gcc aac ggc acg cta ctg gac gct aat tac aag aag ccc aaa ctc 144
Arg Ala Asn Gly Thr Leu Leu Asp Ala Asn Tyr Lys Lys Pro Lys Leu
35 40 45

ctc tac tgt agc aac ggg ggc cac ttc ctg agg atc ctt ccg gat ggc 192

```
Leu Tyr Cys Ser Asn Gly Gly His Phe Leu Arg Ile Leu Pro Asp Gly
     50                  55                  60

aca gtg gat ggg aca agg gac agg agc gac cag cac att cag ctg cag   240
Thr Val Asp Gly Thr Arg Asp Arg Ser Asp Gln His Ile Gln Leu Gln
 65                  70                  75                  80

ctc agt gcg gaa agc gtg ggg gag gtg tat ata aag agt acc gag act   288
Leu Ser Ala Glu Ser Val Gly Glu Val Tyr Ile Lys Ser Thr Glu Thr
                 85                  90                  95

ggc cag tac ttg gcc atg gac acc gac ggg ctt tta tac ggc tca cag   336
Gly Gln Tyr Leu Ala Met Asp Thr Asp Gly Leu Leu Tyr Gly Ser Gln
            100                 105                 110

aca cca aat gag gaa tgt ttg ttc ctg gaa agg ctg gag gag aac gct   384
Thr Pro Asn Glu Glu Cys Leu Phe Leu Glu Arg Leu Glu Glu Asn Ala
        115                 120                 125

act cca gct cca cat tac aac acc tat ata tcc aag aag cat gca gag   432
Thr Pro Ala Pro His Tyr Asn Thr Tyr Ile Ser Lys Lys His Ala Glu
    130                 135                 140

aag aat tgg ttt gtt ggc ctc aag aag aat ggg agc tgc aaa cgc ggt   480
Lys Asn Trp Phe Val Gly Leu Lys Lys Asn Gly Ser Cys Lys Arg Gly
145                 150                 155                 160

cct cgg act cac tat ggc cag aaa gca atc ttg ttt ctc ccc ctg cca   528
Pro Arg Thr His Tyr Gly Gln Lys Ala Ile Leu Phe Leu Pro Leu Pro
                165                 170                 175
```

gtc tct tct gat 540

Val Ser Ser Asp

180

<210> 31

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:primer for PCR

<400> 31

aacaaaagct gggtaccggg 20